

## SECTION 3 System Demands

Water demand projections provide the basis for sizing and planning future water facilities. Water use and production records, combined with projections for urban development, provide the basis for estimating future water requirements. This chapter summarizes the water use and demand projections through the year 2035. This chapter also identifies the City's baseline and target requirements as part of the Water Conservation Bill of 2009.

### 3.1 Baselines and Targets

The Water Conservation Bill of 2009 (Sbx7-7) was enacted in November 2009. To increase water use efficiency, it requires that urban water suppliers reduce the statewide average per capita daily water consumption by 20 percent by December 31, 2020. The Bill requires urban water suppliers to establish their baseline daily per capita water use, an urban water use target and an interim urban water use target, and compliance daily per capita water use.

Table 3.1 includes the data required to calculate the City's base daily per capita water use. The table includes the start and end years for the selected range chosen to comply with Sbx7-7, for both the 10-year and 5-year average. Because the City's recycled water production is not greater than 10 percent of its total 2008 deliveries, the City is not able to use the 15 year base period.

Table 3.1			
Base period ranges			
Base	Parameter	Value	Units
10-year base period	2008 total water deliveries	34,052	AF
	2008 total volume of delivered recycled water	2,985	AF
	2008 recycled water as a percent of total deliveries	8.76	%
	Number of years in base period <sup>1</sup>	10	years
	Year beginning base period range	1994	
	Year ending base period range <sup>2</sup>	2004	
5-year base period	Number of years in base period	5	years
	Year beginning base period range	2003	
	Year ending base period range <sup>3</sup>	2007	

<sup>1</sup> If the 2008 recycled water percent is less than 10 percent, then the first base period is a continuous 10-year period. If the amount of recycled water delivered in 2008 is 10 percent or greater, the first base period is a continuous 10- to 15-year period.

Sbx7-7 requires agencies to calculate its base daily per capita water use in one of three ways. The first calculation requires an estimate of a water agencies average gross water use, reported in gallons per capita per day and calculated over a continuous 10-year period ending no earlier than December 31, 2004 and no

later than December 31, 2010. The second calculation can be used by water agencies that meet at least 10 percent of its 2008 measured retail water demand through recycled water that is delivered within the service area of an urban retail water supplier or its urban wholesale water supplier. If the agency meets the 10 percent requirement, the agency may extend the base daily per capita water use calculation up to an additional 5-years to a maximum of a continuous 15-year period ending no earlier than December 31, 2004 and no later than December 31, 2010. The third calculation requires an urban retail water supplier to provide an estimate of its average gross water use, reported in gallons per capita per day and calculated over a continuous five-year period ending no earlier than December 31, 2007 and no later than December 31, 2010. As shown in Table 3.2, the City's 10-year average baseline calculation is 308.77. The law allows four compliance methods to satisfy the reduction requirements. The City chose method 1 which requires a reduction of water use of 20% from the 10-year average, requiring the City to reduce its water use to 247 GPCD by the year 2020. The City chose method 1 because it offered the City the most reasonable compliance reduction target.

The third calculation, as shown in Table 3.3, is used to meet the legislation's minimum water use reduction requirement per Section 10608.22. Because the City's 10-year average calculation meets the legislation's reduction requirement, the City does not need to further adjust its baseline calculation.

<b>Table 3.2</b>				
<b>Base daily per capita water use — 10- to 15-year range</b>				
<b>Base period year</b>		<b>Distribution System Population</b>	<b>Daily system gross water use (mgd)</b>	<b>Annual daily per capita water use (gpcd)</b>
<b>Sequence Year</b>	<b>Calendar Year</b>			
Year 1	1995	56,026	6,139,014,479	300.19
Year 2	1996	59,044	6,925,267,563	321.33
Year 3	1997	62,315	7,494,606,002	329.50
Year 4	1998	65,765	6,667,450,156	277.75
Year 5	1999	69,518	7,878,531,923	310.49
Year 6	2000	77,627	8,356,564,198	294.93
Year 7	2001	79,564	9,156,087,249	315.27
Year 8	2002	82,586	9,727,304,052	322.69
Year 9	2003	87,442	9,682,010,763	303.35
Year 10	2004	92,856	10,579,404,417	312.14
<b>Average Base Daily Per Capita Water Use</b>				<b>308.77</b>

Table 3.3				
Base daily per capita water use — 5-year range				
Base period year		Distribution System Population	Daily system gross water use (mgd)	Annual daily per capita water use (gpcd)
Sequence Year	Calendar Year			
Year 1	2003	87,442	9,682,010,763	303.36
Year 2	2004	92,856	10,579,404,417	312.15
Year 3	2005	95,143	10,257,789,480	283.40
Year 4	2006	96,436	10,960,324,236	298.65
Year 5	2007	98,634	11,034,292,413	294.13
Base Average Daily Per Capita Water Use				298.34

### 3.2 Water Demands

#### 3.2.1 Water Deliveries

This section provides historical and projected water demands. Demands are summarized by customer type and are presented in Tables 3.3 through 3.7. Historical water use is based upon system deliveries as recorded by the City of Roseville. The projected water demands are based on the City's unit water demand factors and applying them to land use designations in the City's General Plan. The summary tables for projected water demands also shows estimated population, and target future water demands based upon target per capita daily water use from implementation of water demand management measures as outlined in Section 6.

Table 3.4					
Potable Water deliveries — actual, 2005					
	2005				
	Metered <sup>1</sup>		Not metered		Total
Water use sectors	# of accounts	Volume (AF)	# of accounts	Volume (AF)	Volume (AF)
Single family	22,138	11,782	11,309	7460	19,242
Multi-family	0	0	0	0	0
Commercial	1,734	4,611	326	797	5,408
Industrial	0	0	0	0	0
Institutional/governmental	0	0	0	0	0
Landscape (no recycled water)	1,124	6,425	0	0	6,425
Agriculture	0	0	0	0	0
System losses	0	0	0	0	0
Other	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>31,075</b>
<b>Population 2005</b>					<b>95,143</b>
<b>Per Capita Water Use (gpcd)</b>					<b>291.6</b>

<sup>1</sup>Multi-family, Industrial and Institutional water use included in the commercial sector.

Table 3.5					
Potable water deliveries — actual, 2010					
	2010				
	Metered		Not metered		Total
Water use sectors	# of accounts	Volume (AF)	# of accounts	Volume (AF)	Volume (AF)
Single family	32,117	14,564	2,684	1,272	15,836
Multi-family	912	1,290	738	906	2,196
Commercial	1,345	2,011	45	31	2,042
Industrial	25	890	1	1	891
Institutional/governmental	232	656	16	11	667
Landscape (no recycled water)	1,218	5,534	0	0	5,534
Agriculture	0	0	0	0	0
System losses	0	0	0	1,195	1,195
Other	119	272	0	0	272
<b>Total</b>	<b>35,968</b>	<b>25,217</b>	<b>3,484</b>	<b>3,416</b>	<b>28,633</b>
<b>Population 2010 (Dept of Finance)</b>					<b>114,078</b>
<b>Per Capita Water Use (gpcd)<sup>1</sup></b>					<b>214.1</b>

<sup>1</sup>Recycled water use not used to calculate GPCD calculation.

Table 3.6					
Potable water deliveries — projected, 2015					
	2015				
	Metered		Not metered		Total
Water use sectors	# of accounts	Volume (AF)	# of accounts	Volume (AF)	Volume (AF)
Single family	36,461	25,345			25,345
Multi-family	1,859	3,210			3,210
Commercial	1,446	4,764			4,764
Industrial	27	2,435			2,435
Institutional/governmental	256	1,606			1,606
Landscape (no recycled water)	1,269	7,219			7,219
Agriculture	0	0			0
System losses	0	0	0	914	914
Other	119	267			267
<b>Total</b>	<b>41,516</b>	<b>44,846</b>	<b>0</b>	<b>914</b>	<b>45,760</b>
<b>Population Projection – 2015</b>					<b>119,561</b>
<b>Target Per Capita Water Demand</b>					<b>278</b>
<b>Target 2015 Water Demand<sup>1</sup></b>					<b>37,226</b>

<sup>1</sup>Recycled water use not used to calculate GPCD calculation and has been deducted from target water demand.

Table 3.7					
Potable water deliveries — projected, 2020					
	2020				
	Metered		Not metered		Total
Water use sectors	# of accounts	Volume (AF)	# of accounts	Volume	Volume (AF)
Single family	42,036	28,370			28,370
Multi-family	3,452	3,519			3,519
Commercial	1,523	4,787			4,787
Industrial	28	2,614			2,614
Institutional/governmental	270	1,710			1,710
Landscape (no recycled water)	1,336	7,237			7,237
Agriculture	0	0			0
System losses	0	0	0	990	990
Other	119	267			267
<b>Total</b>	<b>48,765</b>	<b>48,504</b>	<b>0</b>	<b>990</b>	<b>49,494</b>
<b>Population Projection – 2020</b>					<b>135,317</b>
<b>Target Per Capita Water Demand</b>					<b>247</b>
<b>Target 2020 Water Demand<sup>1</sup></b>					<b>37,441</b>

<sup>1</sup>Recycled water use not used to calculate GPCD calculation and has been deducted from target water demand.

**Table 3.8**  
**Potable water deliveries — projected 2025, 2030, and 2035**

	2025		2030		2035 – optional	
	metered		metered		Metered	
Water use sectors	# of accounts	Volume (AF)	# of accounts	Volume (AF)	# of accounts	Volume (AF)
Single family	50,369	32,912	50,983	33,232	50,995	33,238
Multi-family	5,206	3,860	6,593	4,129	7,643	4,333
Commercial	1,614	4,944	1,722	5,107	1,851	5,512
Industrial	30	2,816	32	3,053	34	3,326
Institutional/governmental	288	1,827	305	1,967	326	2,126
Landscape (no recycled water)	1,415	7,346	1,514	7,622	1,624	7,897
Agriculture	0	0	0	0	0	0
System losses	0	1,101	0	1,130	0	1,157
Other	119	267	119	267	119	267
<b>Total</b>	<b>59,039</b>	<b>55,071</b>	<b>61,268</b>	<b>56,507</b>	<b>62,592</b>	<b>57,855</b>
<b>Population Projection</b>	<b>160,938</b>		<b>166,021</b>		<b>168,718</b>	
<b>Target Per Capita Water Demand</b>	<b>247</b>		<b>247</b>		<b>247</b>	
<b>Target Water Demand<sup>1</sup></b>	<b>44,530</b>		<b>45,937</b>		<b>46,683</b>	

<sup>1</sup>Recycled water use not used to calculate GPCD calculation and has been deducted from target water demand.

### 3.2.2. Water Sold to Other Agencies

Roseville does not wholesale water to other agencies. Roseville does maintain 13 interties with neighboring water agencies to provide, or receive, water for emergencies or special operating conditions. Interties are described in Section 2. The objective is to match water taken with water delivered between the agencies which occur in most instances. There are, however, occasions due to system limitations that water supplied and water taken are not equal resulting in a water transfer between agencies. This volume of water is very small but is accounted for as delivered water as shown in Table 3.9.

**Table 3.9**  
**Sales to other water agencies (AFY)**

Water distributed	2005	2010	2015	2020	2025	2030	2035 - opt
PCWA Intertie Agreement	236	54	0	0	0	0	0
<b>Total</b>	<b>236</b>	<b>54</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

### 3.2.3. Additional water uses and losses

This section describes additional water uses and losses. Additional water is the amount of City water demands that is met through the use of recycled water supplies. Losses include unaccounted-for water which includes un-metered water use; such as, fire protection and training, system and street flushing, sewer cleaning, construction, system leaks, and unauthorized connections. Unaccounted-for water can also result from meter inaccuracies. The City assumes two percent unaccounted-for water when preparing demand projections. The City recognizes that actual water losses are potentially greater than the 2 percent factor used. However, because the water demand projections are based upon conservative unit demand factors applied to land use entitlements, a relatively low water loss factor is used so as not to significantly overstate future projected water demands. The City intends to be fully metered by 2012, and will be able to better evaluate unaccounted-for water as more data is available for analysis. Table 3.10 below, summarizes additional water uses and estimated system losses.

<b>Table 3.10</b>							
<b>Additional water uses and losses (AFY)</b>							
<b>Water use<sup>1</sup></b>	<b>2005</b>	<b>2010</b>	<b>2015</b>	<b>2020</b>	<b>2025</b>	<b>2030</b>	<b>2035 - opt</b>
<b>Saline barriers</b>	0	0	0	0	0	0	0
<b>Groundwater recharge</b>	0	0	0	0	0	0	0
<b>Conjunctive use</b>	0	0	0	0	0	0	0
<b>Raw water</b>	0	0	0	0	0	0	0
<b>Recycled water</b>	2,045	1,709	2,197	2,670	2,980	3,397	3,770
<b>System losses</b>	0 <sup>1</sup>	1,195	914	990	1,101	1,130	1,157
<b>Other (define)</b>							
<b>Total</b>	<b>2,045</b>	<b>2,904</b>	<b>3,111</b>	<b>3,660</b>	<b>4,081</b>	<b>4,527</b>	<b>4,927</b>

<sup>1</sup> audit not performed in 2005. No water loss information available

### 3.2.4. Total water use

Table 3.11a and 3.11b summarizes total water use projected through 2035. Table 3.11a is based upon target water deliveries the City hopes to achieve through the implementation of water demand reduction measures to lower per capita water use as required by SBx 7-7 while Table 3.11b summarize estimated demands based on historical water demands. Because of the early stage at which the City finds itself with respect to understanding the success at which water reduction measures will reach targeted per capita water use, the City relies upon its water demand projections in Table 3.11b for the planning for future water supplies and infrastructure. This will be re-evaluated as additional water use data and efficiency measures are implemented as part of this plan.

**Table 3.11a**  
**Total water use (AF)**  
**Assumes Reduced Per Capita Water Use is Achieved**

<b>Water Use</b>	<b>2005</b>	<b>2010</b>	<b>2015</b>	<b>2020</b>	<b>2025</b>	<b>2030</b>	<b>2035</b>
Total target water deliveries and losses (from Tables 3.4 to 3.8)	31,075	27,438	37,226	37,441	44,530	45,937	46,683
Sales to other water agencies (from Table 3.9)	236	54	0	0	0	0	0
Recycled water (from Table 3.10)	2,045	1,709	2,197	2,670	2,980	3,397	3,770
<b>Total</b>	<b>33,356</b>	<b>29,201</b>	<b>39,423</b>	<b>40,111</b>	<b>47,510</b>	<b>49,334</b>	<b>50,453</b>

**Table 3.11b**  
**Total water use (AF)**  
**Assumes Historical Water Use**

<b>Water Use</b>	<b>2005</b>	<b>2010</b>	<b>2015</b>	<b>2020</b>	<b>2025</b>	<b>2030</b>	<b>2035</b>
Total water deliveries and losses (from Tables 3.4 to 3.8)	31,075	28,633	45,760	49,494	55,071	56,507	57,855
Sales to other water agencies (from Table 3.9)	236	54	0	0	0	0	0
Recycled water (from Table 3.10)	2,045	1,709	2,197	2,670	2,980	3,397	3,770
<b>Total</b>	<b>33,356</b>	<b>30,396</b>	<b>47,957</b>	<b>52,164</b>	<b>58,051</b>	<b>59,904</b>	<b>61,625</b>

### 3.2.5 Low-income projected water demands

Future housing needs were derived from projections provided by the Regional Housing Needs Allocation Plan (RH NAP), which was adopted by the Sacramento Area Council of Governments (SACOG) in 2008. The California Government Code requires cities to use the growth rate projections contained in the RH NAP. The City has established a 10% Affordable Housing Goal, which is less than the Regional Housing Needs Allocation (RHNA), based on existing and projected fiscal realities rather than a need which cannot be achieved. Water demands for low-income projects are included with the projected water demands as shown in Tables 11a and 11b above as the demand estimates are based upon existing and planned land use. The demand for low-income projects is difficult to estimate but based on water projections in Tables 3.5 to 3.8 and the application of the 10% low income the goal is described in Table 3.12.



**Table 3.12**  
**Low-income projected water demands (AF)**  
**Assumes Historical Water Use**

<b>Low Income Use type</b>	<b>2010</b>	<b>2015</b>	<b>2020</b>	<b>2025</b>	<b>2030</b>	<b>2035</b>
Single Family Residential	1,583	2,534	2,847	3,291	3,323	3,324
Multi-family Residential	219	321	352	386	413	433
<b>Total</b>	<b>1,802</b>	<b>2,855</b>	<b>3,199</b>	<b>3,677</b>	<b>3,736</b>	<b>3,757</b>

### 3.3 Water Demand Projections

As stated previously, Roseville treats and delivers surface water from Folsom reservoir as the primary supply of water. The water volumes are those that have either been paid for or have been scheduled for availability. The information in the requested Table 3.12 is consistent with the requested information in Section 4, Tables 4.1 and 4.2.

**Table 3.13**  
**Retail agency demand projections provided to wholesale suppliers**

<b>Wholesaler</b>	<b>Contracted Volume</b>	<b>2010</b>	<b>2015</b>	<b>2020</b>	<b>2025</b>	<b>2030</b>	<b>2035 - opt</b>
United States Bureau of Reclamation (Folsom Supply)	32,000 AF	32,000	32,000	32,000	32,000	32,000	32,000
Placer County Water Agency (Middle Fork Project water delivered through Folsom Reservoir)	30,000 AF	10,000	15,000	20,000	30,000	30,000	30,000
San Juan Water Agency (Middle Fork Project water delivered through Folsom Reservoir)	4,000 AF	0	4,000	4,000	4,000	4,000	4,000

### 3.4 Water Use Reduction Plan

Reduction in water demand across all customer sectors will be essential to achieving the conservation goals established by legislation and laid out in this plan. Demand Management Measures (DMM's) identified in Section 6 will be the focus of implementation measures to change customer behaviors with the overall objective of increasing water awareness. In addition to the listed DMM's additional activities will be required to achieve the water reductions necessary to meet the reduction goals. Measures that will be considered when developing budgets and project plans include:

- Water reduction strategies for new development:
  - Compliance with Water Efficient Landscape Requirements for all new and renovated landscapes as applied to existing development areas. New development areas are also required to reduce landscape area and calculated water demands as part of the process for land use approval. This has been a successful approach in recent land use negotiations.
  - Increased utilization of recycled water in new development areas. Roseville has typically required recycled water to be used in any land use development areas currently being planned. The level of use is consistent with semi-aggressive measures, utilizing recycled water for landscaping associated with commercial, industrial, multi-family, parks, and transportation corridors. Roseville has yet to implement recycled water in single family residential applications or for internal uses.
  - Implementation of low water use fixtures and other plumbing features as required by then current Building Code requirements. In some instances Roseville can incentivize/require conserving measures over that required by building code. (i.e. HET Toilet, re-circulating hot water systems)
  
- Water reduction strategies for existing development:
  - Landscape improvement programs
    - “Cash for Grass” to provide incentives for removal of turf in existing landscape areas and replace with low water use alternatives.
    - Landscape design assistance to provide homeowners with ideas and alternatives that will result in lower water use for same landscape areas under renovations or replacement.
  - Plumbing retrofit incentives as appropriate on existing residences and businesses
  - Conversions of landscape areas currently irrigated with potable water to recycled water as appropriate.
  - System rehabilitation and resulting reduction in water loss
  
- Customer behavior change:
  - Realize future generations will be more conservation minded and looking for ways to incorporate more water conserving measures in their homes and businesses. This will result in a gradually shift in water awareness and demand.
  - Water billing opportunities to communicate water use correlation to utility bill more clearly. Items to be considered are water budget billing and increased block water rates to incentivize water conservation.

Economic impacts of future reduction measures will be determined as individual programs are developed.

It is assumed that potential exists for impacts in the areas of:

- Increased cost of programs will result in high water bills required to pass costs on to consumers. This may result in the potential for reduced economic development.
- On the positive there may be opportunities for niche markets and services related water efficiency programs, equipment and services. As awareness in water efficiency increases along with water costs private offerings will develop to meet customer needs, creating opportunities for business growth in the area.